

What is claimed is:

1 1. A virtual or real image display system, comprising:

- 2 a) a primary image source for projecting a primary image from the start of a  
3 primary light path to an end of the primary light path at which the  
4 primary image is viewable;
- 5 b) a mirror;
- 6 c) a first beamsplitter positioned in the primary light path between the primary  
7 image source and the mirror;
- 8 d) circular polarizing means for circularly polarizing a light beam positioned in  
9 the primary light path between the first beamsplitter and the mirror; and
- 10 e) linear polarizing means for linearly polarizing light positioned in the  
11 primary light path between the end of the primary light path at which  
12 the image is viewable and the first beamsplitter,

13 whereby outside light entering the system is substantially blocked before  
14 exiting the system to thereby substantially eliminate ghost image  
15 formation caused by outside light sources.

1 2. An image display system as in claim 1, wherein the circular polarizing means is a quarter  
2 wave plate.

1 3. An image display system as in claim 1, wherein the circular polarizing means is a quarter  
2 wave plate that includes a first surface, a second surface, and a clear substrate layer on  
3 each of said first and second surfaces.

1 4. An image display system as in claim 3, wherein each of said clear substrate layers further  
2 includes an anti-reflective coating thereon.

- 1 5. An image display system as in claim 1, wherein the mirror is a spherical concave mirror.
- 1 6. An image display system as in claim 1, wherein the mirror is an aspherical concave mirror.
- 1 7. An image display system as in claim 1, further comprising background projecting means  
2 for projecting a background image viewable with the primary image.
- 1 8. An image display system as in claim 1, further comprising a secondary image source and a  
2 second beamsplitter positioned between the secondary image source and the primary  
3 light path for projecting the secondary image viewable with the primary image.
- 1 9. An image display system as in claim 1, wherein the first beamsplitter is positioned at about  
2 a 45 degree angle relative to the primary light path.
- 1 10. An image display system as in claim 1, wherein the system is an on-axis system.
- 1 11. A virtual or real image display system, comprising:  
2 a) a primary image source for projecting a primary image from the start of a  
3 primary light path to an end of the primary light path at which the  
4 primary image is viewable;  
5 b) a mirror;  
6 c) a first beamsplitter positioned in the primary light path between the primary  
7 image source and the mirror;  
8 d) a quarter wave plate positioned in the primary light path between the first  
9 beamsplitter and the mirror; and  
10 e) a linear polarizer positioned in the primary light path between the end of the  
11 primary light path at which the image is viewable and the first  
12 beamsplitter,

whereby outside light entering the system is substantially blocked before exiting the system to thereby substantially eliminate ghost image formation caused by outside light sources.

12. An image display system as in claim 11, wherein the quarter wave plate includes a first surface, a second surface, and a clear substrate layer on each of said first and second surfaces.

13. An image display system as in claim 12, wherein each of said clear substrate layers further includes an anti-reflective coating thereon.

14. An image display system as in claim 11, wherein the mirror is a spherical concave mirror.

15. An image display system as in claim 11, wherein the mirror is an aspherical concave mirror.

16. An image display system as in claim 11, further comprising background projecting means for projecting a background image viewable with the primary image.

17. An image display system as in claim 11, further comprising a secondary image source and a second beamsplitter positioned between the secondary image source and the primary light path for projecting the secondary image viewable with the primary image.

18. An image display system as in claim 11, wherein the first beamsplitter is positioned at about a 45 degree angle relative to the primary light path.

19. An image display system as in claim 11, wherein the system is an on-axis system.

20. A method of decreasing ghost images in a real or virtual imaging system, comprising the steps of:

a) projecting a primary image outside the imaging system;

- 5 b) passing outside unpolarized light entering the imaging system through a  
6 linear polarizer to produce a first linear polarized light;
- 7 c) beam-splitting the first linear polarized light;
- 8 d) passing the beam-split, first linear polarized light through a quarter wave  
9 plate to produce a first circular polarized light;
- 10 e) reflecting the first circular polarized light off a concave mirror to produce a  
11 second circular polarized light having a rotation opposite that of the  
12 first circular polarized light;
- 13 f) passing the second circular polarized light through the quarter wave plate to  
14 produce a second linear polarized light having an orientation opposite  
15 that of the first linear polarized light;
- 16 g) beam-splitting the second linear polarized light; and
- 17 h) blocking the beam-split, second linear polarized light with the linear  
18 polarizer,
- 19 thereby substantially eliminating ghost image formation in the imaging system  
20 due to outside light sources.

1 21. A method as in claim 20, wherein the beamsplitter is inclined at a 45 degree angle  
2 relative to the light path.

1 22. A method as in claim 21, further comprising projecting a secondary image viewable with  
2 the primary image.

1 23. A method as in claim 21, further comprising superimposing a background image onto the  
2 primary image.